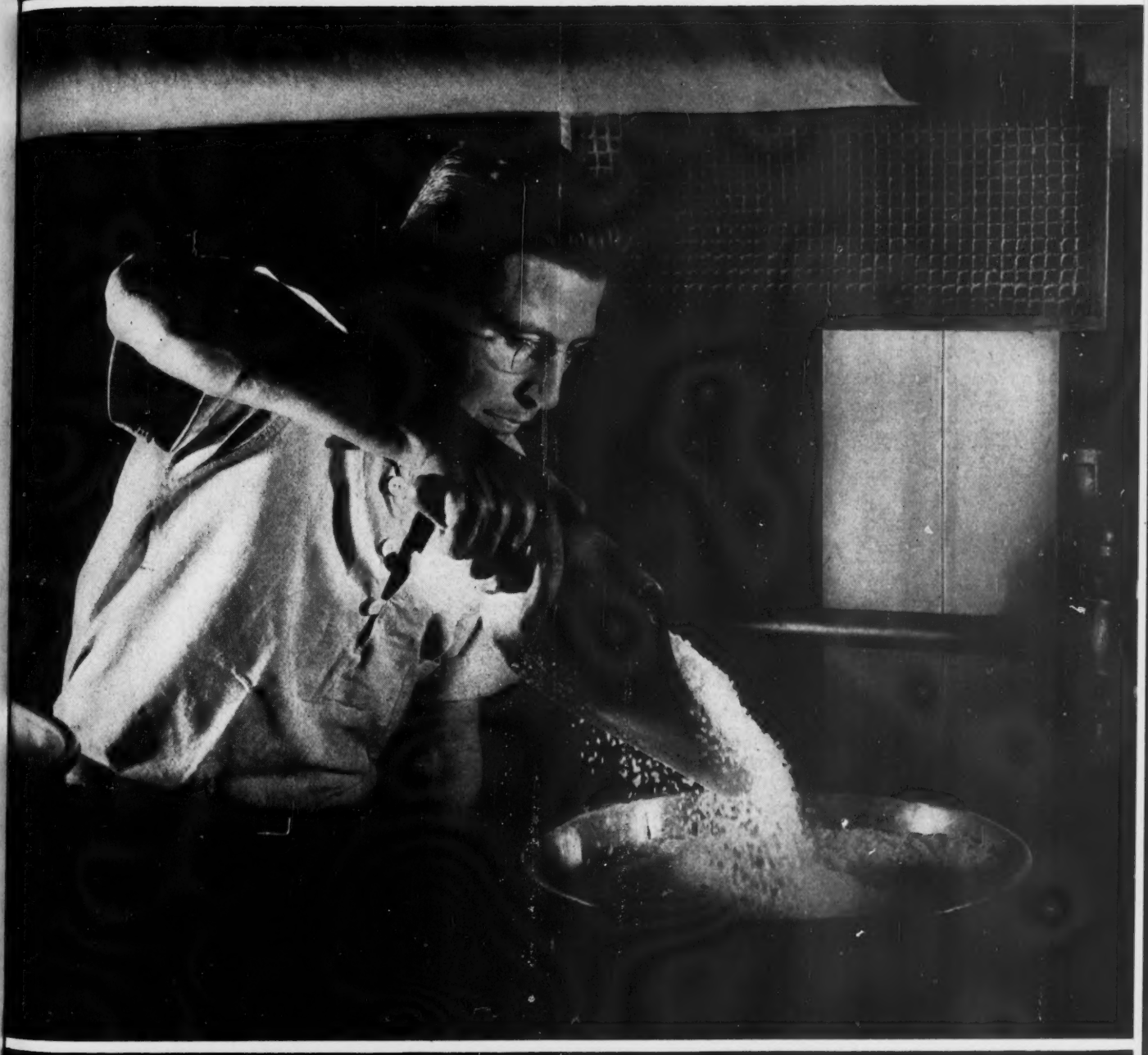
Industrial

March 1946

# Standardization



## For Safety in the Plastics Industry

(see article on page 53)

In Two Parts—Part I

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# Readers Write

## For Better 16-mm Film Projection

*University of the State of New York*

*Gentlemen:* May I commend you for your efforts in setting up better standards for 16-mm motion picture projectors and equipment. My experience over New York State is that the projectors are often installed at such a distance from the screen that either the light or the lens is inadequate to give the kind of image we need. Too often the projectors break down so that the show is either interrupted or called off. Frequently they scratch or otherwise injure good film.

All in all, the service we get from the 16-mm is far below that which the pupils see daily in the theatres. The program of physical education, recreation, and camping which we are trying to develop are packed with activities that make films which are interesting to the pupils, the public, and the profession. However, our efforts to aid in the production and to make use of such films in these fields is severely handicapped by the factors listed above regarding 16-mm equipment. Therefore, if your organization can set up standards to keep this service on a level that will compare favorably with pictures seen in the movie theaters, we will go a long way ahead during the next few years in visual education. I am sure that the use of 16-mm film and equipment in physical education, recreation, and camping will be greatly expanded in the near future, if this is done.

C. D. MILES
Supervisor of Physical Education and Recreation

• • The comments in this letter are being referred to the Sectional Committee on Standards for Motion Pictures, Z22, sponsored by the Society of Motion Picture Engineers.

*University of Alabama*

*Gentlemen:* Your work on standardizing sizes of children's clothing is taking care of a long felt need. I have mothers inquiring and begging for the day when all sizes will be standard. In the interest of these mothers, my clothing classes, and a forthcoming publication can you give me the latest developments in standardizing sizes for children under age thirteen?

LUCILLE REA
*Instructor,*
*Clothing and Textiles*

• • M. Lonie of the National Bureau of Standards has recently developed tentative standards for children's sizes, and Miss Rea was referred to him for further information. These tentative standards have not yet been approved as American standards.

## Information for Use in Building Codes

*International City Managers' Association*

*Gentlemen:* I have a copy of your mimeograph report listing sources of information on material for use in building codes which you issued on January 15, 1942. I think this report is most valuable and I would be glad if you would let me know whether you have issued a later edition of this pamphlet.

ORIN F. NOLTING
*Assistant Director*

• • A new edition of this document, "Information on Sources of Material for Use in Preparing and Revising Local Building Codes", was issued in November 1944.

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## Standards in Library on Safety and Fire Protection

*Moore and Wright Company*

*Gentlemen:* At the present time we are in the process of assembling an extensive library of Safety and Fire Protection publications and materials, to better serve the interests of Port Huron. We have a variety of manufacturers here and would appreciate all the materials you can provide, on all industries and phases of operation.

D. I. GRAHAM

• • The American Standards Association was pleased to send Moore and Wright Company a pamphlet on ASA Safety Code and a list of American Standards.

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## Greetings from Finland

*National Standards Association of Finland*
*(Finlands Standardiseringskommission)*

*Gentlemen:* At the beginning of the new year we are wishing you and your associates the compliments of the season and hoping that the cooperation in the work of standardization may be resumed and continued in the same pleasant way as before the war.

A. WILLBERG
Secretary

## Our Front Cover

This photograph, taken at the Arlington Plant of the Plastics Department, E. I. du Pont de Nemours & Company, shows nylon as delivered to the Plastics Department in the form of flake. It is being fed into the hopper of the spinning machine where it is melted and extruded into filaments.


# Industrial Standardization

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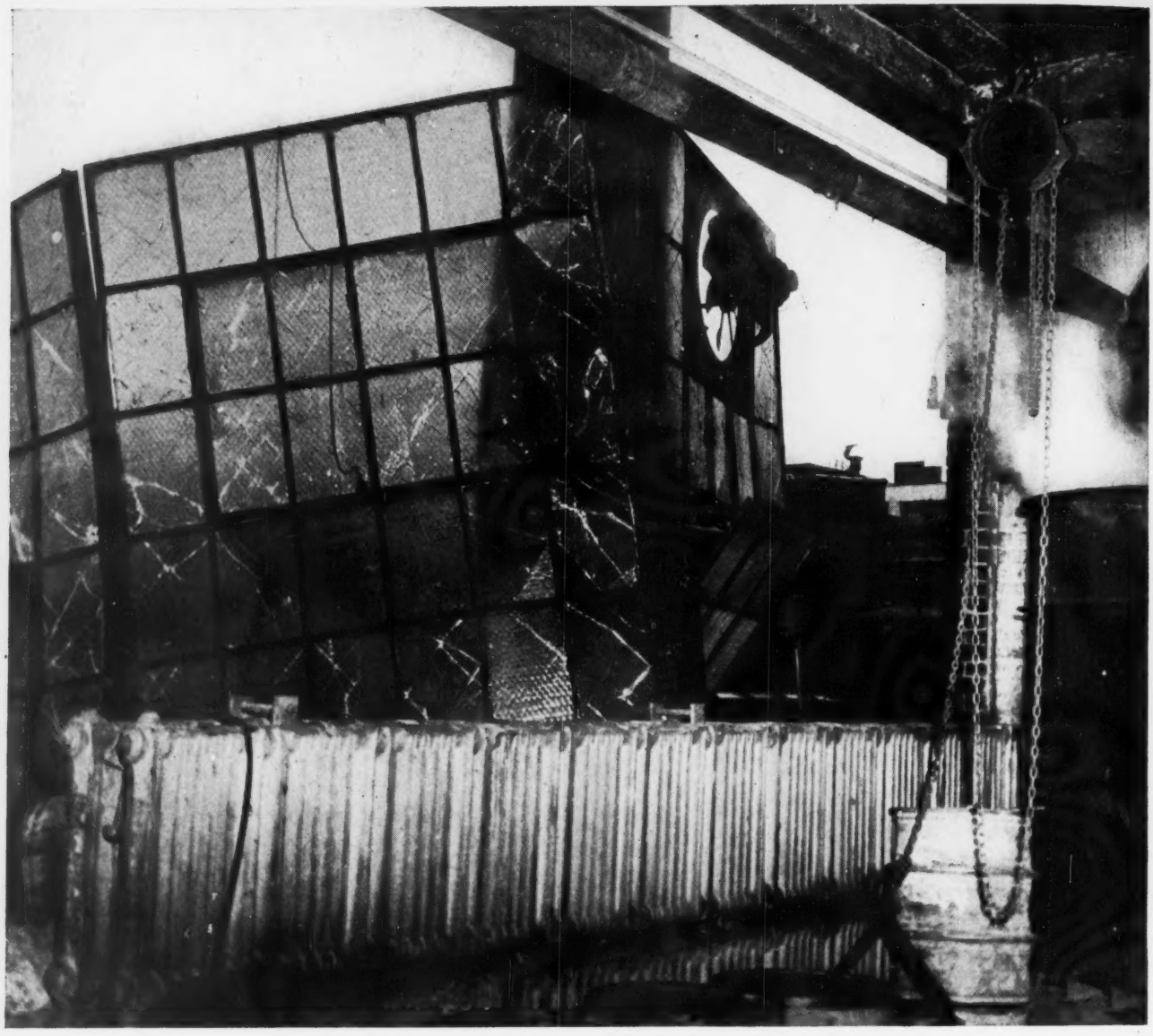
Catalog of American Standards

The Pictures—Cover—DuPont Company: Frontispiece, 54—Associated Factory Mutual Fire Insurance Companies: 57—Westinghouse.


March, 1946 Ruth E. Mason, Editor 35 Cents


Standardization is dynamic, not static. It means not to stand still, but to move forward together.


Subscription price $4.00 per year (foreign $5.00). Special to schools and libraries $2.00 (foreign $3.00). Re-entered as 2nd Class Matter 7/31/43, at the Post Office, New York, N. Y., Act of March 3, 1879.



An explosion of plastic dust blew out this large steel window sash, which was lightly anchored at the walls. The fact that the window sash was easily blown out released the explosion pressure before it became high enough to cause serious structural damage.

With the approval of the new standard for the plastics industry the total number of American Standards for the prevention of dust explosions is now 16.

# For Safety in the Plastics Industry

## New Standard Tells How to Prevent Hazardous Explosions of Plastic Dust

**By Hylton R. Brown**

*Chairman of the ASA Sectional Committee on Safety Code for the Prevention of Dust Explosions; Senior Engineer of the Bureau of Mines, U. S. Department of the Interior.*

MANY organizations have cooperated in the preparation of the Safety Code for the Prevention of Dust Explosions in the Plastics Industry, which was approved as an American Standard on November 30, 1945.

In the last 10 or 12 years this industry has experienced very rapid growth and expansion. New types of plastics have been produced, new uses for plastics have been found, new manufacturing methods have been devised, and new sources of raw material have been developed. Older manufacturers are constantly trying to improve their product and others are striving to develop some new variety that they hope or believe will prove commercially superior to those already on the market. In some cases new companies have been formed for the specific purpose of making a newly developed type of plastic.

Many of the manufacturers, through their trade association, the Plastic Materials Manufacturers Association, had an opportunity to review and comment on the new code before it was presented to the Dust Explosion Hazards Committee for adoption. The committee, which functions both as a sectional committee of the American Standards Association and as a technical committee of the National Fire Protection Association, is composed of members representing a wide variety of industries subject to dust explosion hazards, and organizations interested in both fire and explosion prevention. A list of the committee members who participated in the preparation of the new code is given on page 55.

Certain types of plastics such as pyroxylin have been known and generally used for 75 years or more and the fire hazards in both the manufacture and use of products made from such materials have been recognized. The National Board of Fire Underwriters has issued Regulations for the Storage, Handling, and Use of Pyroxylin Plastic in Factories Making Articles Therefrom, and a bulletin entitled *Safeguarding Pyroxylin Plastic* has been prepared and distributed by the Plastics Manufacturers Association.

The properties and characteristics of the many new types of plastics now produced vary widely, but nearly all are considered readily flammable and special efforts have been made to provide safeguards against ignitions. Attention has also been given to the development of methods of extinguishing any fires that start in either the raw material or the finished product. Some varieties of plastics present unusual problems because they contain enough oxygen to support combustion, and fires cannot be extinguished with ordinary smothering agents.

No company attempts to manufacture all of the new types of plastics, but all realize that with few exceptions the dust produced or the pow-

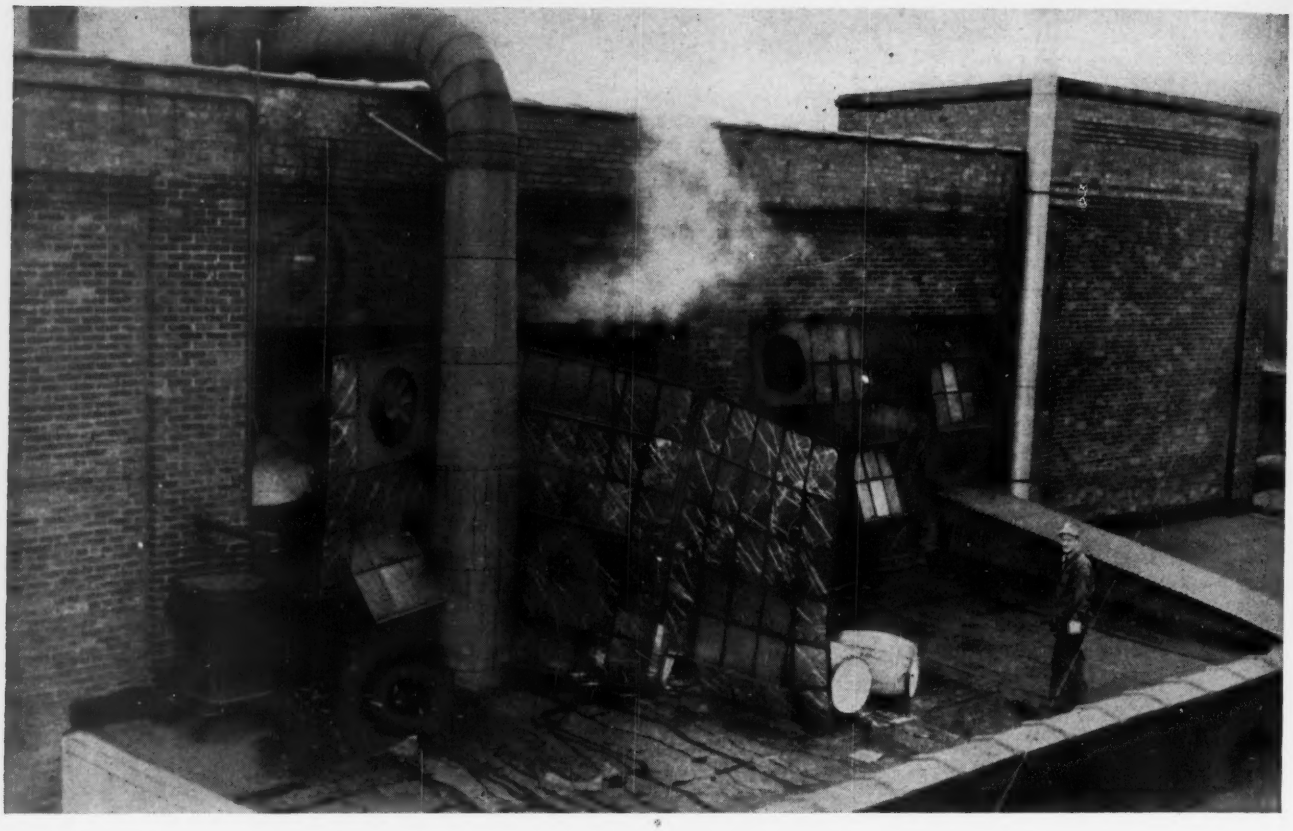
In addition to the approval of the new American Standard Safety Code for the Prevention of Dust Explosion Hazards in the Plastics Industry, revisions in two standards previously approved have also been completed. These are a revision of the American Standard Safety Code for the Installation of Pulverized Fuel Systems, the title of which has now been changed to American Standard Safety Code for the Installation of Pulverized Coal Systems, and a revision of the American Standard Safety Code for Explosion and Fire Protection in Plants Producing or Handling Magnesium Powder or Dust. The new edition of the code for pulverized coal systems is a complete revision of the 1942 edition. The revision of the magnesium code is minor, dealing principally with a slight change in a schematic drawing of dust-collecting equipment.

All of the standards for prevention of dust explosions are available in a book published by the National Fire Protection Association. The NFPA expects to issue a new edition of this book, containing the revisions and the new plastics code, late this year. In the meantime, copies of the new plastic standard and the revised code for the installation of pulverized coal systems and a revision sheet for the magnesium standard have been prepared so they can be slipped into the present edition of the book. Copies of these inserts can be obtained from the American Standards Association. They are:

American Standard Safety Code for the Installation of Pulverized Coal Systems, (Revision of Z12.1-1942) Z12.1-1945

American Standard Safety Code for Explosion and Fire Protection in Plants Producing or Handling Magnesium Powder or Dust, (Correction sheet showing revision of Z12.15-1942) Z12.15-1945

American Standard Safety Code for Prevention of Dust Explosion Hazards in the Plastics Industry, Z12.16-1945 25 cents



**Doors, windows, and partitions were damaged here by an explosion during the preparation of an ingredient used in making plastics.**

ders used in their processes are highly explosive when in the form of dust clouds in suspension in air. The problems involved in providing protection against such explosion hazards were presented to the Dust Explosion Hazards Committee several years ago and this group started work immediately on the code which has now become an American Standard.

The original program adopted by the committee was planned to obtain and make available pertinent data on the explosive properties and combustible characteristics of dusts or powders used in all plastic industries and to provide information on methods that could be adopted to obtain protection against the hazards.

Arrangements were made to have tests and experiments conducted in the Bureau of Mines laboratories with 57 powder or dust samples obtained from 15 different manufacturers. The samples included natural and synthetic resins, molding compounds with and without fillers or plasticizers, and a number of the primary ingredients used.

The tests were designed to provide information on ignition temperatures of the dusts, minimum energy required for ignition, minimum explosive concentration of dust clouds, maximum explosion pressure, and both average and maximum rates of pressure rise. Some additional tests were made to obtain information on the permissible percentage of oxygen in atmosphere to prevent explosions of the different powders.

It is not possible in this article to describe or even list the materials tested and give the results obtained. The code as adopted by the National Fire Protection Association and approved by the American Standards Association contains tables that summarize some of the information obtained and readers or users of the code are referred to Bureau of Mines Report of Investigation No. 3751 entitled *Inflammability and Explosibility of Powders Used in the Plastics Industry* for details and descriptions of testing methods.

In interpreting the results of the laboratory tests the committee endeavored to translate them into recommendations that were both practical and commercially adoptable. Representatives of the industry collaborated in this phase of the work and the code contains sections dealing with plant arrangement, building construction, communications, electrical equipment, housekeeping, and fire-extinguishing systems with special recommendations covering explosion preventive measures and steps that can be taken to minimize the effect and extent of explosions.

### Plant Arrangement—

Previous experience has demonstrated the advantages of proper arrangement of buildings in plants subject to explosion hazards. Segregation of dangerous units and proper spacing to prevent the propagation of an explosion from one unit to another are recommended.

### Building Construction—

Modern plants are generally of fire-resistive construction and the code recommends such construction particularly for buildings where plastic material may be handled or processed in dry powder form. In addition to being fire-resistive there are many other construction features that should be incorporated in the building to facilitate cleaning and prevent the accumulation of dangerous deposits of dust on ledges or surfaces where it could be thrown or blown into suspension. Recommendations in the code urge attention to such details.

### Communications—

By eliminating direct communication between rooms, buildings, or sections of a plant it is frequently possible to restrict the extent of an explosion and limit the loss. In dealing with this phase of the problem the committee incorporated in the code recommendations covering (1) horizontal communications such as doorways, hallways, tunnels, and galleries; (2) vertical openings such as elevator and stairway enclosures and bins extending through several floors; and (3) communications between equipment provided by conveyors, spouts, chutes, and pipe openings. Even dust-collecting systems designed to keep dust out of the working areas of a plant may be the means of communication through which an explosion can spread from one section of a plant to another.

### Electrical Equipment—

Information obtained in the laboratory tests on the ease of ignition of plastic powders indicated the importance of providing protection against even small and comparatively weak sparks. The energy required to ignite some dusts amounted to only 0.01 joule or less than 0.00001 Btu. To reduce the possibility of ignition by sparks the code provides that all electrical equipment shall be in accordance with the regulations of the National Electrical Code. Provisions should also be made by plant operators for the control and removal of static electricity, and any possibility of producing metallic sparks where explosive dust is present should be eliminated.

### Housekeeping and Fire Protection—

Good housekeeping is essential in any plant where fire and explosion hazards are present and the proper type of fire-extinguishing equipment carefully maintained is necessary. Both of these subjects are covered by recommendations in the new code.

### Inert Gas—

Laboratory tests and practical experience have demonstrated the possibility of preventing dust ignition by reducing the oxygen percentage in the atmosphere. In grinding equipment, mixers, and other equipment, or in bins and similar enclosures where it is practical to maintain atmospheres with low oxygen percentages, complete protection can be obtained by diluting the air entering such places with an inert gas such as carbon dioxide or nitrogen. The code contains a table listing 28 powders used in the plastics industry with the maximum permissible oxygen percentage to prevent explosions.

Sixteen standards for the prevention of dust explosions in various industries have now been approved by the American Standards Association. This safety program is carried on by a committee under the sponsorship of the National Fire Protection Association through its Committee on Dust Explosions which is organized as a sectional committee of the American Standards Association. Representatives of industries that produce potentially explosive materials and those that may be affected by such explosions are members of this committee. They are:

Hylton R. Brown, Bureau of Mines, U. S. Department of the Interior, *Chairman*
American Boiler Manufacturers Association and Affiliated Industries, *E. G. Bailey*
American Feed Manufacturers Association, *Eugene Arms*
American Foundrymen's Association, Inc., *S. B. Hansen*
American Society of Mechanical Engineers, *R. M. Ferry; Walter S. Rearick (alternate)*
Association of American Railroads, Operations & Maintenance Department, Operating-Transportation Division, Fire Protection & Insurance Section, *R. O. Wager*
Associated Factory Mutual Fire Insurance Companies, *A. L. Kling*
Association of Mill and Elevator Mutual Insurance Companies, *Eugene Arms*
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Western Actuarial Bureau, *Kent H. Parker*
Member-at-Large, *Heston S. Hirst; Edwin B. Ricketts*

### Explosion Vents—

Recently developed dust-explosion-prevention codes have stressed the desirability of providing pressure-release vents on equipment and buildings to prevent the development of high pressures capable of causing structural damage. This subject has been given special attention during the past year by both the Dust Explosion Hazards Committee and a special committee organized to study explosion venting. The present code contains illustrations showing several suggested methods of providing vents on equipment. Several curves are included in the code to illustrate the relationship between time and pressure development and the relationship between the ratio of venting area to volume and the explosion pressure developed.

An innovation in this code consists of a special section describing a method of calculating the size of an explosion vent required for the release of explosion pressure from a room or enclosure at a rate that will prevent the pressure from reaching a pre-determined maximum. Although no proven conversion factor for large scale work is yet available, and experience has demonstrated that such calculations are not saetisfactory for certain long slender enclosures such as ducts or elevator legs, the information obtained from some laboratory tests is given as a guide for use in planning venting equipment with the added recommendation that a reasonable factor of safety be included in all designs.

# New Material in Standard on Automatic Stations

***By George Sutherland and G. S. Lunge***

**Nationally approved standards for telemetering equipment and supervisory control and indication equipment, as well as for automatic switching equipment, are expected to increase use of centralized systems of electric power control.**

A REVISION of the 1937 edition of the American Standard for Automatic Stations was prepared early in 1945 by the Automatic Stations Committee of the American Institute of Electrical Engineers. It was later reviewed by the ASA Sectional Committee on Power Switchgear, C37, and received the approval of the American Standards Association on December 11, 1945.

In the revision, the title of the standard was changed, to fit the scope more accurately, to the "American Standard for Automatic Station Control, Supervisory, and Telemetering Equipments".

Control of electric power transmitted from the generating station to homes, factories, and offices is quite frequently handled automatically by means of automatic station equipment, telemetering equipment, and supervisory control and indication equipment. Automatic switching equipment controls the individual steps involved in putting each machine or feeder in the power system in or out of service, and makes necessary adjustments in the power system to take care of fluctuations in the electrical load. Telemetering equipment reads the load at various points to give the dispatcher or supervisor, located elsewhere, quantitative information as to whether performance of the machines or circuits in the automatic stations is satisfactory. Supervisory control and indication equipment shows the dispatcher, by means of lamps and audible signals, the operating position of all circuit breakers and power-operated switches, thus making it possible for him to control the complicated network of electric power equipment from some distant central point.

The American Standard for Automatic Station Control, Supervisory, and Telemetering Equipments, C37.2-1945, provides standard definitions, standard tests, and a standard language of numbers for identifying on drawings and on the devices themselves, the many complicated devices making up the complete equipment. It also includes a table showing the minimum protection that should be given to power apparatus and feeders.

The fact that a national standard now exists which provides dielectric tests for supervisory control and telemetering equipment is expected to increase the use of this remote-control equipment and result in easier operation of all centralized systems of electric power control. This is the opinion of the authors of this article.

Copies of the standard are available from the American Standards Association at 40 cents each.

New material was included in the new edition to bring it up to date. In addition, minor changes were made in the definitions to correspond to the definitions for these same terms in related American Standards, such as the American Standard for A-C Power Circuit Breakers, C37.4 through .9-1945.

### New Material Now Included

Because the close similarity of many names of feeder types (stub feeder; multiple feeder; stub-multiple feeder; etc) may lead to confusion, simple one-line diagrams are now used to illustrate the definitions for these terms.

Another important addition to the new standard is the specification of dielectric test voltages for supervisory control and telemetering equipments. Such equipment is not covered by any other existing American Standard, whereas practically all other individual devices used in automatic stations are already governed by existing national standards.

### Principal Changes Since 1937

One of the principal changes in the standard since the 1937 edition concerns the use of numbers for device functions. Each device in an automatic switching equipment has a device function number which is placed adjacent to the device symbol on all wiring diagrams and arrange-

***George Sutherland,*** *Consolidated Edison Company of New York, is chairman of the ASA Sectional Committee on Power Switchgear, C37 and represents the Electric Light and Power Group.*

***G. S. Lunge,*** *General Electric Company, is secretary of the committee and represents the American Institute of Electrical Engineers.*

ment drawings. In addition, the device function number is attached to or located adjacent to each device so that it may be readily identified.

When device function numbers were first introduced for use in automatic stations, each manufacturer established his own standard series of numbers from 1 to 99. Later, to the temporary discomfiture but ultimate satisfaction of those having to use elementary or other diagrams for automatic station equipment, a single series of device function numbers from 1 to 99 for use by all manufacturers was adopted.

It was this "common language" of automatic switchgear practice that appeared in the AIEE Standard No. 26 for Automatic Stations published in April 1928 and revised in 1930. A few changes in the meanings of these standard numbers were made in the 1937 edition of the American Standard for Automatic Stations, chiefly in the direction of generalizing or broadening the significance of some of these numbers. This tendency is again evident in the 1945 edition of the standard.

### New Functions Developed Recently

During the last eight years, the need for certain device functions has largely disappeared, at least in new equipments, and the standard device numbers thus freed have been eagerly seized upon to cover new functions that were not contemplated a quarter of a century ago when use of these standard device numbers first became general. Increasing use of mercury-arc rectifiers, distance relays, and pilot protection schemes, for example, has occasioned the use of some new device function numbers. More recently it has become common practice to use these convenient numbers for *all* types of switchgear equipments and not only in automatic stations.

This has also made it desirable to include 29 standard letter suffixes for the device numbers (instead of the 17 suffixes in the 1937 standard), and further expansion of these will undoubtedly occur in the future. The letter "A", for example, is used to indicate air, automatic, or accelerating auxiliary devices; B for blower; and BB for bucking bar for high speed breaker.

Only 99 different standard device numbers are conveniently possible. When, for instance, the meaning of automatic device No. 4 in a machine equipment is established, this also fixes the meaning of devices 104, 204, and 304 in a reclosing (or automatic transfer) feeder, supervisory controlled machine, or supervisory controlled feeder equipment, respectively. Of these 99, in the 1937 standard 13 were unassigned and could be used at will. In the 1945 edition of the standard only 8 are still available for such miscellaneous functions in individual installations.

Gone from the list are:

57. Current regulating relay (now 90C)
58. Voltage regulating relay (now 90V)
84. Generator relay (now combined with exciter relay 53)
85. Commutation control relay
95. Closing relay

Newly assigned device function numbers include:

7. Anode circuit breaker
21. Impedance relay
69. Permissive control device
74. Alarm relay
75. Position changing mechanism (for a removable breaker unit)
77. Impulse transmitter
81. Frequency device
85. Carrier (or pilot wire) receiver relay

These 99 standard device numbers constitute the switchgear equipment engineer's shorthand, which has already saved an incalculable amount of time in making and using electrical diagrams and instruction books. By using numbers rather than letters for the basic functional designations, this system transcends language barriers and may in time become international. It is also conveniently usable with appropriate letter suffixes to designate auxiliary devices or important electrical components of a complicated device.

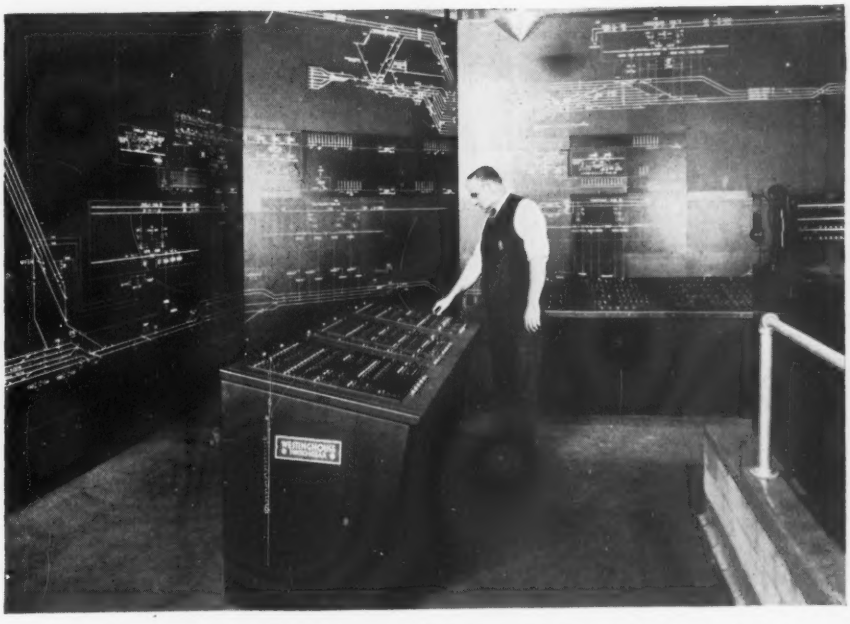
A few changes will also be noticed in the table showing the minimum protection to be provided for automatically controlled power apparatus and feeders. In addition to naming the types of protection required, this table now lists the function numbers of the devices, one or more of which would ordinarily be used to provide each particular type of protection.

An automatic station, if unattended, will ordinarily contain, besides the main power apparatus (machines, tranformers, rectifiers, etc.):

(*a*) Automatic switching equipment, *to control the individual steps* involved in putting each machine or feeder in or out of service. This uses devices in the series 1 to 99 and 101 to 199.

(*b*) Telemetering equipment, to give the dispatcher or supervisor, located elsewhere, *quantitative information* on the performance of the machines or circuits in the automatic station.

(*c*) Supervisory control and indication equipment, *to show the dispatcher, by means of lamps* and audible signals, the operating position of all breakers and power-operated switches and *permit him to control* the station remotely. This uses devices in the series 201 to 299 and 301 to 399.



This shows a part of the supervisory control dispatcher's control desk, located in the dispatching office of a large electrified railroad. Ten remote substations are controlled by multi-station supervisory control, the farthest station being 125 miles away.

The 1937 edition of the standard covered only the first of these three classes of equipment. Although some small automatic stations have no provision for remote (supervisory) control of machine output or voltage level, and the machines start and stop automatically in response to water-level, voltage, or current conditions, or to a time switch, in the majority of recent installations supervisory control of these functions is considered an indispensable adjunct to the automatic switching equipment at the unattended station. The fact that an American Standard is available governing at least the dielectric test requirements for supervisory control and telemetering equipment should increase confidence in such equipment and foster its wider application, with resulting increased ease of centralized system operation.

## New ASA Committee to Assure Continued Interchangeability of Electric Lamps

IN order to assure to the public continued interchangeability of the various types of household and commercial lamps, including new types of lamps which will from time to time be put on the market, the American Standards Association has been asked to set up standards in this field.

A representative committee, organized by the ASA to do the job, held its first meeting Tuesday, February 19, at the Waldorf-Astoria in New York. Those in attendance included representatives of user groups, lamp manufacturers, technical and trade associations, and departments of the Federal government. Preston S. Millar, president of the Electrical Testing Laboratories, was appointed chairman of the new committee, and J. W. McNair of the American Standards Association, secretary.

The job as roughly outlined in this first committee meeting will include standards of interchangeability of incandescent lamps, and of interchangeability of gaseous conduction lamps, and of the electrical characteristics of operating auxiliaries; and methods of test for such lamps and auxiliaries. It was tentatively agreed that the ground work would be carried out through three subcommittees: one on incandescent lamps; one on fluorescent lamps, mercury vapor, and the like; and a third covering methods of testing lamps and auxiliaries.

Special attention will be given by the committee to the newer types of fluorescent and mercury lamps now coming into wide use.

## Standards from Other Countries

Standards received recently from other countries and now filed in the ASA Library include the following.

### Australia

Aluminium and Aluminium Alloys, No. H41-45

### Great Britain

Gymnastic Apparatus for Use in Schools, CH (BS/MOE) 2876.

### France

The following standards are available only in French; the titles alone have been translated into English.

Building—Carpentry:

- Casement Window with 2 Panels, with Mullions; Type 32/51, P23-413, April 1944
- Casement Window with 2 Panels, with Mullions; Type 37/61, P23-414, April 1944
- Casement Window with 3 or 4 Opening Panels, with Mullions; Type 32/51, P23-411, April 1944
- Casement Window with 3 or 4 Opening Panels, with Mullions; Type 37/61, P23-412, April 1944
- Casements, French Windows, Compound Windows without Mullions; Type 32/51, P23-405, April 1944
- Casements, French Windows, Compound Windows without Mullions; Type 37/61, P23-406, April 1944
- Composition of Windows (Casement and French), P23-403, April 1944
- Dimensions of Casement and French Windows, P20-401, April 1944
- Hardware for Casements and French Windows, P23-415, April 1944
- Hardware for Doors, P23-429, November 1944
- Hardware for Hinged and Pivoted Windows and Transoms, P23-416, April 1944
- Interior Doors, Panelled, P23-423, November 1944
- Interior Doors, Panelled, Three Equal Leaves, P23-425, November 1944
- Interior Doors, Panelled, Unequal Leaves, P23-424, November 1944
- Interior Doors, Panelled, Unequal Leaves, with Stiles, P23-428, November 1944
- Interior Doors, Panelled, with Stiles, P23-427, November 1944
- Interior Swinging Doors, Panelled, P23-426, November 1944
- Types of Casement and French Windows (width 120 cm), P23-404, April 1944
- Window and Hinged Transom; Type 32/51, P23-407, April 1944

# New Board Supervises Work of SAE Technical Committee

CREATION of an SAE Technical Board to exercise general direction and supervision of all SAE technical committee operations has been approved by the Council of the Society of Automotive Engineers, Inc.

Purpose of the Board is to give the SAE Council a single responsible body through which to administer the Society's technical committee work—as its meetings operations are administered through a General Meetings Committee, its membership activities through a General Membership Committee, and other Society functions through similarly centralized groups. Experience in the handling of war projects has emphasized the many advantages possible from integration of technical committee work at the policy level, from clarification of procedures and interrelationships between various committees, and from preservation of freedom of action in the technical work of individual committees.

### Based on Experience Gained During War

The design for the Technical Board was drawn from SAE experience in directing and operating the vastly expanded technical committee activity demanded by World War II. As suggested, the Technical Board combines supervisory functions—such as those exercised by the War Activity Council—with the operating practices and procedures applied so effectively by the War Engineering Board and the Aeronautics Division. So set up, the new Board is seen as an effective tool for use by the SAE Council in speeding reconversion to peacetime requirements and in carrying forward the postwar technical committee work. Coordination of all technical committee work under the new Board is designed also to provide the best possible means for continuing the important permanent services to the military which already have been requested of the Society.

### Integrates Standards with Other Technical Work

To fulfill these major objectives, the new Technical Board has been given broad authority (subject, of course, to the Council's ultimate authority) to organize and carry on all phases of the Society's technical committee work. It is empowered to set up such standing and temporary technical working committees as may be necessary to handle the projects undertaken. Scopes for these working committees are determined by the Board. Scope in any particular case might encompass standardization, research, or any other kind of appropriate cooperative engineering work. Thus, through the Board's integrating function, the limitations and possible conflicts inherent in the existing operations of a standards committee or a research committee are eliminated, and the particular group of technicians selected to do a particular job is freed to encompass all technical committee phases of their particular projects as indicated by project scopes designed to insure attainment of given objectives.

Although these changes benefit the Society materially in permitting a better coordinated operation of the technical committee work as a whole, they make little difference in the practical functioning of many of the existing working committees. For example, the present Iron and Steel Division of the General Standards Committee has become simply the "Iron and Steel Committee" under the new set-up. As regards standardization, it functions exactly as in the past, except that it reports to the Technical Board instead of to a General Standards Committee. This is also true of other committees.

### Foresee Need for New Committees

Need for new committees will arise and opportunities will come for changes in the scope and direction of present committees. These new committees will be appointed and these new opportunities grasped promptly under the proposed new Technical Board procedures. In some cases the new committees will become "standing committees". In others, special project committee work will be wound up quickly and the committee disbanded.

The whole concept of the new Board's operation involves a gradual, rather than a sudden, dovetailing of the steps toward effective coordination of the Society's various technical committee operations under the Board's broad grant of authority.

Direction and supervision of all technical committee activities of the SAE have been centralized in the recently created Technical Board. The Board consists of 24 members selected by the SAE Council for their outstanding technical qualifications and drawn from the various branches of automotive engineering within the Society's scope. Board members are appointed for three-year terms, the various appointments being arranged so that one-third of the Board will retire each year.

### Technical Committee Reports Subject to Board Action

All technical committee reports are subject to final action by this representative Board, which will also clear them for subsequent distribution and publication by the Publication Committee. Normally, the Board's decision on a technical committee report constitutes final action by the Society, but the right of appeal to the SAE Council, in case of disagreement, is definitely included in the proposed plan.

Technical advisory relations with Government agencies, trade associations, civic organizations, and other outside groups, which always have been a major element of the Society's technical committee work, come within the Board's purview, as does SAE participation in cooperative activity with other engineering organizations.

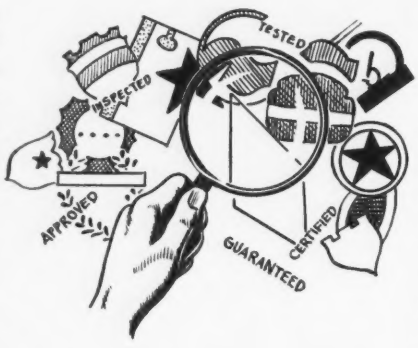
The establishment of the Technical Board resulted from intensive study of the Society's existing technical committee operations in relation both to current and postwar requirements in this vital area of Society activity.

## 855 Standards Listed In ASA Price List

A total of 855 American Standards and American War Standards now available from the American Standards Association are listed in the new edition of the ASA price list distributed as Part 2 of this issue of INDUSTRIAL STANDARDIZATION.

# Booklet for High School Students Tells About Use of Standards

HIGH school pupils will have an opportunity to learn about standards from a booklet, *Using Standards and Labels*, prepared as Unit No. 6 in the Consumer Education Series sponsored by the National Association of Secondary-School Principals. The Association is a department of the National Educational Association. The Consumer Education Study, for which this booklet was prepared, is financed by funds from the National Better Business Bureau.




Consumer education is having a rapid development in secondary schools, Thomas H. Briggs, director of the Consumer Education Study, explains. In attempting to prepare teaching-learning units, such as Unit No. 6, so that they will be useful to the maximum number of schools, the Consumer Education Study is concentrating on general principles underlying all consumption, he declares. The units do not attempt either to promote the interests of producers and sellers or to revolutionize our economic system, he explains; instead, the units are intended to help young people to become more intelligent, more effective, and more conscientious consumers in the economic system in which they live.

### Standards Provide Information for Intelligent Use of Incomes

Standards are important to the new generation of consumers because they help to provide the information needed for the most intelligent use of their incomes. This is the theme of the booklet. "Money . . . is always a little scarce," it explains. "If we shoot straight with it, we bring home lots of bacon. If we miss too often—or waste it—we don't eat so well, have as good clothes, cars, or houses, or get as much fun out of things."

The study calls attention to the spectacular progress in the common language of standards, measurements, and specifications in the world of science and industry. The purpose of consumer education, it points out, is to get into our everyday consumer buying more of the same accuracy we display in the world of production.

A resumé of the history of standardization is given from the time of primitive man, with his simple system of barter, to our present complex system of exchange. Confusion grew out of such indefinite measures as the foot, the cubit, or the "royal cubit", but gradually, fixed measures were decided upon and standards set up. Science, industry, and government are now cooperating to bring about standardization in the consumer field which will parallel the program in other fields of production, the study declares.

### Work of American Standards Association Is Explained

The work of the American Standards Association as well as that of many Government and business organizations is explained.

In order to give the pupils an understanding of the problem, it is suggested that they make an active investigation of the use of labels in shopping. A description of the labels now in use for a variety of different products is followed by a description of the services of testing and rating agencies. Excerpts from the Proposed American Standard Practice in Public Approval and Certification Procedures are included with an analysis of each provision as it might be applied to the different testing and certifying agencies.

Copies of *Using Standards and Labels, A Problem of the Modern American Consumer*, can be obtained from the National Education Association, 1201 Sixteenth Street, N.W., Washington 6, D. C.

## Data on Fire Resistance To Help Committee Work

Among the subjects of interest to the Sectional Committee on Building Code Requirements for Fire Protection and Fire Resistance, A51, is the fire resistance of ceilings, now under study in Subcommittee 1. Completion of a research study on this subject has just been announced by the National Bureau of Standards, one of the three sponsors for this project.

In connection with a project sponsored by the National Housing Agency, fire tests were made at the Bureau on typical ceiling constructions and, in addition, data (when applicable) were compiled from other tests that had been made of ceilings exposed as part of floor constructions.

The ceilings were found to give protection to supporting members and to prevent communication of fire for periods ranging from 8 minutes for wood lath and lime plaster to 60 minutes for a metal lath and plaster ceiling supported on steel joists. Protection in the range 11 to 16 minutes was given by gypsum boards or sanded gypsum plaster on gypsum or metal lath attached directly to wood joists. The protection was considerably increased by mineral wool insulation placed over metal lath and plaster ceilings suspended below wood joists.

It is expected that the research report will be studied by the ASA Sectional Committee on Building Code Requirements for Fire Protection and Fire Resistance, A51, which is working under the sponsorship of the National Board of Fire Underwriters, the National Fire Protection Association, and the National Bureau of Standards.

## Fire Underwriters Measure Radio Shock Hazard

The Underwriters' Laboratories, Inc, has issued a new bulletin entitled *Measurement of Electric Shock Hazard in Radio Equipment.*

Radio receivers have several possible sources of leakage current that may introduce the hazard of electric shock. The normal tests of component parts and of specific leakage paths are shown to be undesirable substitutes for direct measurement of

the shock hazard under standard load conditions.

This bulletin provides a general description of the factors relating to electric shock in radio receivers. A summary of the data from the literature furnishes background information regarding limits for the measurements and for the choice of a testing instrument. The development of a suitable vacuum-tube voltmeter (diode-peak meter) is described and its use is explained. This meter serves as the basis for a set of specifications that are suitable for standardized and simplified shock hazard determinations applicable to all types of electrical equipment.

The diode-peak meter, the shock hazard specification, and the test method described by this bulletin is being incorported in the new edition of the American Standard for Power-Operated Radio Receiving Appliances, C65.1-1942 under the sponsorship of Underwriters' Laboratories.

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# NBS Acts on Standards

### Pipe Nipples; Brass, Copper, Steel, and Wrought-Iron, CS5-46—

A revision of the Commercial Standard for Pipe Nipples; Brass, Copper, Steel and Wrought-Iron, CS5-46, is effective for new production after February 15, 1946.

This standard covers steel, ferrous-alloy, and wrought-iron pipe nipples, black- and zinc-coated (hot-dip galvanized), in iron-pipe sizes from ⅛ to 12 inches, inclusive, of standard lengths; and brass and copper nipples in standard sizes from ⅛ to 6 inches, inclusive, of standard lengths.

Ferrous-iron pipe nipples are furnished in the following weights: standard weight, extra strong, and double extra strong.

Brass and copper pipe nipples are furnished in the following weights: standard weight and extra strong.

### Mineral Wool—Testing and Reporting, CS131-46—

This Recommended Commercial Standard for Industrial Mineral Wool Products, All Types—Testing and Reporting, TS-4030, was circulated throughout the industry for acceptance and has now been approved as CS131-46. It will be effective for new production from March 15.

### Sine Bars, Blocks, Plates, and Fixtures, TS-4066, Recommended Commercial Standard—

This standard covers the major essential requirements for and identification of sine bars, sine blocks, sine plates, sine bar fixtures, and sine plate fixtures.

# ASA Standards Activities

## American Standards

### American Standards Available This Month

For American Standards published recently see page 63.

### Standards Being Considered by ASA for Approval

Building Code Requirements for Reinforced Concrete, A89 (ACI 318-41)
*Sponsor:* American Concrete Institute

Drawing and Drafting Room Practice, Z14.1
*Sponsors:* American Society of Mechanical Engineers; Society for the Promotion of Engineering Education

Gear Tolerances and Inspection, B6.6
*Sponsors:* American Gear Manufacturers Association; American Society of Mechanical Engineers

Graphical Symbols for Electric Power and Control, Z32.3 (Revision of Z32.3-1946)
*Sponsors:* American Institute of Electrical Engineers; American Society of Mechanical Engineers

*Motion Picture Photography*
*Sponsor:* Society of Motion Picture Engineers

Emulsion and Sound Record Positions in Camera—Negative for 35-Mm Sound Motion Picture Film (Revision of Z22.2-1941 to be designated as American Standard Emulsion and Sound Record Positions in Camera for 35-Mm Sound Motion Picture Film, Z22.2)

Emulsion and Sound Record Positions in Projector—Positive for Direct Front Projection for 35-Mm Sound Motion Picture Film (Revision of Z22.3-1941 to be designated as American Standard Emulsion and Sound Record Positions in Projector for 35-Mm Sound Motion Picture Film, Z22.3)

Emulsion Position in Camera—Negative for 16-Mm Silent Motion Picture Film (Revision of Z22.9-1941 to be designated as American Standard Emulsion Position in Camera for 16-Mm Silent Motion Picture Film, Z22.9)

Emulsion and Sound Record Positions in Camera—Negative for 16-Mm Sound Motion Picture Film (Revision of Z22.15-1941 to be designated as American Standard Emulsion and Sound Record Positions in Camera for 16-Mm Sound Motion Picture Film, Z22.15)

Emulsion Position in Camera—Negative for 8-Mm Silent Motion Picture Film (Revision of Z22.21-1941 to be designated as American Standard Emulsion Position in Camera for 8-Mm Silent Motion Picture Film, Z22.21)

Theater Projection Rooms Revision of American Recommended Practice Z22.28-1941 to be designated as American Standard Practice for Projection Rooms and Lenses for Motion Picture Theaters, Z22.28)

Theater Projection Screens (Revision of American Recommended Practice Z22.29-1941 to be designated as American Standard Practice Dimensions of Theater Projection Screens, Z22.29)

Safety Film (Revision of American Recommended Practice Z22.31-1941 to be designated as American Standard Practice for Motion Picture Safety Film, Z22.31)

*Still Photography*
*Sponsor:* Optical Society of America

Method for Determining Photographic Speed and Speed Number (Revision of Z38.2.1-1943)

Method for Determining Spectral Sensitivity Indexes and Group Numbers for Photographic Emulsions, Z38.2.4

Diffuse Transmission Density, Z38.2.5

### American War Standards Being Considered as American Standards

Method of Determining Freedom from Travel Ghost in 16-Mm Sound Motion Picture Projectors, Z52.4-1944 (To be designated as American Standard Z22.54)

Method of Determining Resolving Power of 16-Mm Motion Picture Projector Lenses, Z52.5-1944 (To be designated as American Standard Z22.53)

Specification for Multi-frequency Test Film Used for Field Testing 16-Mm Sound Motion Picture Projection Equipment, Z52.8-1944 (To be designated as American Standard Z22.44)

Specification for 3000-Cycle Flutter Test Film for 16-Mm Sound Motion Picture Projectors, Z52.9-1944 (To be designated as American Standard Z22.43)

Specification for Sound-Focusing Test Films for 16-Mm Sound Motion Picture Projection Equipment, Z52.11-1944 (To be designated as American Standard Z22.42)

Method of Making Intermodulation Tests on Variable Density 16-Mm Sound Motion Picture Prints, Z52.15-1944 (To be designated as American Standard Z22.51)

Sound Records and Scanning Area of 16-Mm Sound Motion Picture Prints, Z52.16-1944 (To be designated as American Standard Z22.41)

Specification for 400-Cycle Signal Level Test Film for 16-Mm Sound Motion Picture Projection Equipment, Z52.17-1944 (To be designated as American Standard Z22.45)

Reduction Printing from 35-Mm to 16-Mm Motion Picture Film—16-Mm Positive Aperture Dimensions and Image Size for Positive Prints Made from 35-Mm Negatives, Z52.24-1944 (To be designated as American Standard Z22.46)

Reduction Printing from 35-Mm to 16-Mm Motion Picture Film—Negative Aperture Dimensions and Image Size for 16-Mm Duplicate Negatives Made from 35-Mm Positive Prints, Z52.25-1944 (To be designated as American Standard Z22.47)

Contact Printing of 16-Mm Motion Picture Film—Printer Aperture Dimensions for Contact Printing 16-Mm Positive Prints from 16-Mm Negatives, Z52.26-1944 (To be designated American Standard Z22.48)

**War Standards Being Considered as American Standards (Continued)**

Contact Printing of 16-Mm Motion Picture Film—Printer Aperture Dimensions for Reversal and Color Reversal Duplicate Prints, Z52.27-1944 (To be designated as Z22.49)

Reel Spindles for 16-Mm Motion Picture Projectors, Z52.34-1945 (To be designated as American Standard Z22.50)

Sound Records and Scanning Area of 35-Mm Sound Motion Picture Prints, Z52.36-1945 (To be designated as American Standard Z22.40)

Method of Making Cross-Modulation Tests on Variable Area 16-Mm Sound Motion Picture Prints, Z52.39-1944 (To be designated as American Standard Z22.52)

*Sponsor:* Society of Motion Picture Engineers.

### Withdrawal of Approval Being Considered

American Standard for Outlet Boxes, C33a-1929

# American War Standards

### American War Standards Approved Since Our February Issue

Location and Size of Picture Aperture of 16-Mm Sound Motion Picture Cameras, Z52.47-1946

Location and Size of Picture Aperture of 16-Mm Silent Motion Picture Cameras, Z52.48-1946

Registration Distance and Mounting Dimensions for 16-Mm Motion Picture Camera Lenses, Z52.50-1946

Base Point for Distance (Focusing) Scales for Lenses for 16-Mm Motion Picture Cameras, Z52.51-1946

### War Standards Under Way

Allowable Concentration of Trichloroethylene, Z37

Radio Noise, Methods of Measuring, C63

Safety Code for the Industrial Use of X-Rays, Z54
- Use and Storage of Radium in the Field of Industrial Radiography, Part II

**War Standards Under Way (Continued)**

**Safety Code for X-Rays (Continued)**
- Methods and Materials of X-Ray Protection, Part III
- Specific Applications for 400 Kv and Lower, Part IV
- X-Ray Protection for Voltages of One and Two Millions, Part V
- Electrical Protection, Part VI

Screw Threads, BI
- Buttress Threads
- High-Duty Studs in Light Alloys
- Instrument Threads
- Stub Acme Threads
- Unification of Screw Threads

Women's Industrial Clothing, L17
- Jackets for Outdoor Wear (Slide Fastener Closure), L17.6
- Jackets for Outdoor Wear (Fly-Type Button Closure), L17.5

Wood Poles, 05
- Ultimate Fiber Stresses of Wood Poles, 05aWS

# News About ASA Projects

### Methods of Measuring Radio Noise, C63—

A meeting of the War Committee on Methods of Measuring Radio Noise was held February 20 and it was decided to undertake the preparation of a proposed standard for noise meters. The fact that an extensive research program is being carried on at the University of Pennsylvania will make it possible, it is expected, to have enough information at hand to prepare a draft standard for noise meters within 60 to 90 days. The committee also recommended that the existing JAN specification for methods of measuring noise, which had been prepared under the auspices of this war committee, should be submitted to the American Standards Association for approval as an American War Standard.

A subgroup has been appointed to formulate recommendations which will be presented to the United Nations Standards Coordinating Committee at a meeting that is being planned for this summer at London.

### Photography, Z38—

*Sponsor:* Optical Society of America.

Subcommittee 2 on Sensitometry held a special meeting February 15 and decided that it would be advisable to develop peacetime standards for exposure meters. A small subgroup was appointed to prepare a first draft based on the American War Standards for Exposure Meters:—Specification for Service-Model Photographic Exposure Meters (Reflected-Light Photoelectric Type), Z52.12-1944; Acceptance of Photographic Exposure Meters (Reflected-Light, Photoelectric Type), Z52.21-1944; Calibration of Photographic Exposure Meters (Reflected-Light, Photoelectric Type); and Abuse-Testing Mechanism for Photographic Exposure Meters, Z52.30-1944.

### Safety in Electric and Gas Welding and Cutting Operations—

The Standards Council of the American Standards Association is considering the initiation of a new project for the development of peacetime standards for safety in welding and cutting operations. This project would be expected to take into consideration the American War Standard on Safety in Electric and Gas Cutting and Welding Operations, Z49.1-1944. This peacetime project has been requested by the American Welding Society, which has offered to serve as sponsor. It has been suggested that the scope of the proposed peacetime project be the same as that of the wartime project: "Protection of workers from accidents, occupational diseases, and fires arising out of the installation, operation, and maintenance of electric and gas welding and cutting equipment."

### Safety Codes for the Prevention of Dust Explosions, Z12—

*Sponsor:* National Fire Protection Association.

The committee on Dust Explosion Hazards of the NFPA, and Sectional Committee on Dust Explosion Hazards of the American Standards Association held its annual meeting January 29 to act on revisions of codes for the prevention of dust explosions.

### Standards for Electric Lamps, C78—

The meeting to organize the new sectional committee on this recently authorized project was held February 19. Preston S. Millar, Electrical Testing Laboratories, was named chairman, and J. W. McNair, American Standards Association, secretary. (For more complete information, see article page 58.)

### War Standards for Photography and Motion Pictures, Z52—

The ASA war project for photography and motion pictures has now been terminated, and many of the standards approved as American War Standards are being considered by the appropriate sectional committees for approval as regular peacetime American Standards. The war committee, which worked under the chairmanship of R. B. Shepard of Underwriters' Laboratories, Inc, and with J. W. McNair of the ASA staff as secretary, finished its work with an outstanding record of achievement. Of the 71 standards undertaken by the committee, 59 were completed and approved as American War Standards. Five of these were adopted as Joint Army-Navy standards, and one as a Federal Specification.

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# Plastering Association Adopts American Standard

The Board of Governors of the National Foundation for Lathing and Plastering, Inc recently adopted as the Foundation's Minimum Specifications for Lathing and Plastering, the American Standard Specifications for Gypsum Plastering, including Requirements for Lathing and Furring, A42.1-1938. This action was taken in order to furnish local committees with the basic information by which to decide whether the lathing and plastering on any particular house, other building, or project merits the Performance Plaque of the Foundation. The American Standard referred to is at present under consideration for revision in the ASA sectional committee.

# ELEVATOR INSPECTORS' HANDBOOK, SCREW THREADS, AND PHOTOGRAPHY STANDARDS ARE NOW AVAILABLE

THE new edition of the American Standard for Inspection of Elevators (the Inspectors' Manual) and the American Standard for Screw Threads for High-Strength Bolting (just converted to American Standard from an American War Standard) appear in the list of new standards available this month, together with a list of American Standards and American War Standards for different phases of photography.

Outstanding among the photography standards is an American Standard Practice for Conversions of Weights and Measures for Photographic Use, particularly important since the inch and metric systems are both used extensively in the photographic standards. Probably of special interest to amateur photographers will be the standardization of exposure time marking for between-the-lens shutters as provided in the American War Standard Z52.62-1946. That this method of marking is followed can be checked by means of the American War Standard Method of Determining Performance Characteristics of Between-the-Lens Shutters Used in Still Picture Cameras. It is expected that both these standards, as well as many of the other American War Standards on photography, will be accepted without change for peacetime use.

Copies of these standards are available to ASA Members on their membership quota (see below), with additional copies at 20 percent discount. To nonmembers of the American Standards Association, copies are available at the prices quoted.

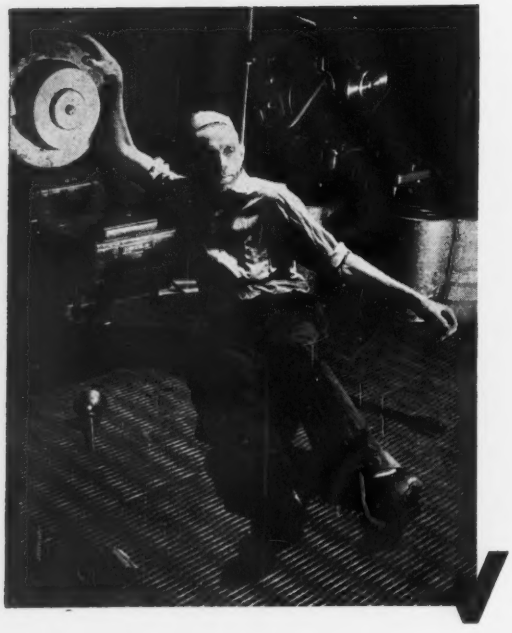
American Standards Association • ASA • 70 East 45th Street, New York 17, N. Y.

| No. of Copies | ASA Number | Title of Standard | Price |
|---|---|---|---|
| ..... | A17.2-1945 | **Inspection of Elevators** (Inspectors' Manual) ..... | **$1.25** |
| ..... | B1.4-1945 | **Screw Threads for High-Strength Bolting** ..... | **.25** |
| ..... | Z38.8.2-1945 | **Conversions of Weights and Measures** for Photographic Use, Practice for ..... | **.10** |
| ..... | Z52.18-1945 | **Contact-Printers, Photographic,** Specification for (JAN-C-250) | **Gratis** |
| ..... | Z52.31-1945 | **Leaders and Trailers for 16-Mm Sound Motion Picture Release Prints** Made from 16-Mm Original Material (American War Standard) ..... | **.25** |
| ..... | Z52.33-1945 | **Reels and Reel Containers;** 16-Mm Motion Picture Projection, Specification for (JAN-R-214) ..... | **Gratis** |
| ..... | Z52.62-1946 | **Exposure Time Marking** for Between-the-Lens Shutters (American War Standard) ..... | **.10** |
| ..... | Z52.63-1946 | **Method of Determining Performance Characteristics of Between-the-Lens Shutters** Used in Still Picture Cameras (American War Standard) ..... | **.30** |
| ..... | Z52.65-1946 | **Method of Determining Performance Characteristics of Focal Plane Shutters** Used in Still Cameras (American War Standard) ..... | **.30** |
| ..... | Z52.68-1946 | **Dimensions and Location of Direct Finder Aperture** for 35-Millimeter Motion Picture Cameras (American War Standard) | **.10** |
| ..... | Z52.69-1945 | **Auxiliary Finder Aperture for 35-Millimeter Motion Picture** Cameras (American War Standard) ..... | **.10** |

**ASA COMPANY MEMBERS** *are entitled to* ***one free copy of each*** *newly approved American Standard for the first $50 of annual membership, and an additional copy for each $100 beyond this. These standards can be obtained through your company representative. We will be glad to give you his name, if necessary.*

# *Check* the Efficiency of Your

## ACCIDENT PREVENTION PROGRAM!



New rules for classifying industrial accidents and for compiling frequency and severity rates are given in the new edition of American Standard Z16.1-1945.

A standard practice for selecting and classifying the factors contributing to the causes of accidents is given in American Recommended Practice Z16.2-1941.

*By Using the*

✓ American Standard Method of Compiling Industrial Injury Rates, Z16.1-1945 **$.20**

✓ American Recommended Practice for Compiling Industrial Accident Causes. Z16.2-1941

(Part 1—Selection of Accident Factors
Part 2—Detailed Classification of Accident Factors) **$1.00**

**For uniform statistics, comparable throughout all companies and industries**

Prepared by a nationally representative sectional committee of the American Standards Association under the sponsorship of the National Safety Council, the National Council on Compensation Insurance, and the International Association of Industrial Accident Boards and Commissions

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